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ABSTRACT

How self-esteem is related to social environment and the elastic-plastic processing of mindies was studied in students aged 13 to 16 years. A "mindy" is a unit process of the mind constructed through using a mental shape. Subjects were 12 students aged 13, 31 students aged 14, 31 aged 15, and 6 aged 16 at a secondary comprehensive school in Greater Helsinki (Finland). A questionnaire and a test were constructed for the variables. Bell-shaped curves were assumed to exist for the variables. Reliabilities and validities of the measures were assessed after item analysis, and they proved to be rather reasonable. The process analysis included the construction of the empirical images of the variables, which were analyzed by solving simultaneous differential equations. The results indicate that the obtained exponential functions are linearly related. These results warrant conclusions that the social environment constructs positive self-esteem, which promotes the development of complete elastic-plastic processing of mindies. Speed increases during the process and transfer from an unstable equilibrium to stable equilibrium occurs. Some possibilities to promote development are suggested. Age differences in the relationships among self-esteem, the social environment, and mindy processing are discussed. (Contains one figure, three tables, and seven references.) (SLD)

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Educational Significance of Related Self-Esteem
to Social Environment and Elastic-Plastic
Processing of Mindies in 13-16 Years of Age

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Running head: EDUCATIONAL SIGNIFICANCE

Abstract

The objective of the study was research how related self-esteem to social environment and elastic-plastic processing of mindies (=unit processes of mind) associate in the ages from 13 to 16 years. The numbers of the subjects were 12, 31, 31, 6 in the order of age from a secondary comprehensive school in the same school district in Greater Helsinki. A questionnaire and a test were constructed for the variables. Bell shaped curves were assumed to exist between the variables. Reliabilities and validities of the measures were assessed after item analysis. They proved to be rather reasonable. The process analysis included the construction of the empirical images of the variables, which were analyzed with solving simultaneous differential equations. The results indicated the obtained exponential functions are linearly related. The results warranted conclusions, social environment constructs positive self-esteem, which promotes the development of complete elastic-plastic processing of mindies. Motion is accelerating during the process and transfer from unstable equilibrium to stable equilibrium occurs. Some possibilities were shown to promote the development.

Educational Significance of Self-esteem Related
to Social Environment and Elastic-Plastic
Processing of Mindies in 13-16 Years of Aged.

The study is the last one in a series the purpose of which is to research processes of mind in 13-16 years old and to find regularities during the growth. The objective of the study is to find out whether self-esteem is connected with mindies (= unit processes of mind

I have not seen much devotion to the subject for example in ERIC, although the processes of mind may be in crucial position in education. At the very bottom, edumetrics comes from statistics, although a unit process of mind is lacking. Thus there remains an impression of applying beliefs to educational operations than to utilize firmly established research knowledge. I see the approach as perverted because metric is driven into heads when headmetrics does not exist. That is why it is essential to obtain information about the possible unit processes their nature and transformation because it offers opportunities to educational and didactical procedures to promote learning and adoption of things. Simultaneously, it offers situations to misuse the

obtained information for other purposes such as indoctrination, brainwashing, commercial manipulation, and as an entity mind control. However, I leave the applications later, if the results warrant to them.

The essences of mind have much pondered and there is no need to list the figures that have been influential in the development of behavioral sciences. However, according to my educated guess the many approaches have a burden of dogma and they need commitment to rituals that finally open the eyes to the world from a certain illuminating angle of view. Ryle (1983) and Gregory (1981) has dealt with mind thoroughly and they seem to be less dogmatic than in most cases. Mind, however, has remained as an enigma.

The problem is much of reduction. In the similar manner as biology cannot be deduced from biochemistry and biophysics, education is not reducible to behavioral sciences and psychometrics. Therefore educational science has problematics of its own.

Well, I am not able to say a strange thing happened on my way to the series of the studies. The mental process began for 20 years ago but its applications pop up now. The original question was: How does a mental shape emerge? The problem was

approached from a contourological viewpoint that means the importance of countour in shaping mental processes. The results from the adult findings indicated there exists a croupier process that regulates how and in what order the mental shape forms (Laasonen, 1992). A shape by definition has a characteristic of vagueness and it is not suitable for a unit process of mind. That is why, the idea of a mindy emerged as a unit process of mind. In theory, it was necessary to differentiate between three concepts (a) a mental shape (b) a mindy (= process), and (c) a configuration. In this context there is no need to go a more detailed discussion about the differences between the concepts. Instead, the prominent features of the concepts are (a) vagueness (b) organization, and (c) stability, accordingly above.

The process of the emergency of a mental shape was clear, in a rough scale. So it was consistent to transfer to the problems of the mindy. The mindy study (Laasonen, 1993a) indicated the mindy includes two subprocesses where the mental shape is utilized as a sketch for the mindy construction. A serial preparatory subprocess when the whole outfit is "ignited" which produces a mindy. Simultaneously,

the rules of implementation are given. The second subprocess is a parallel making subprocess that functions automatically and does not include the original serial control but a lower level regulation. The most obvious difference between the subprocesses is the considerably greater amount of operators in the serial control subprocess.

One question that is a focal point in the mind processes is the way of dealing with information whether serially or in parallel manner. Thus it was necessary to obtain knowledge about the possible mode of processing. The results (Laasonen, 1993b) showed development is from parallel processing towards the serial processing in the processing . Fluctuations and reversals occur during the process. The study of the mindies extended to concern social mindies, too.

The results of the social mindies study indicated a process of dress (Laasonen, 1993c). Dicausalities and various developmental circles emerge, for example suppression, maintenance, evaluation of one's own social action, and a preliminary stage of realism in social relation. As an entity the social mindies process develops from minute social concern and social amusement

towards the examination of one's social relations and a more realistic conception from other persons.

In the study of creativity and conventional solutions (Laasonen, 1993d) one could see clearly the creative mindies need vivid real imagination, good feeling, and a certain amount of undisciplined cognitive processing of environmental information assimilated into a mindy again. The trick is "the barber shaves his own beard." On the contrary, the customary productivity is more synchronal with the primitive and depressive affects.

Theoretical Examination and Expectation

I assume, the characteristics of mind such as nonspaciousness, direct access, privacy, and relations about environment are true. However, more is needed to express the nature of mind. A feature that is neglected is transparency (a dynamic transparent process). If mind is nonspatial then in mind is not a permissible sentence because of the in. Mind as a total process makes it possible to choose various angles of viewpoint.

The results of the research series refer to such kind of a total process where the operations take place between points, immaterial clusters of information.

Where contour stores and releases the needed information points. Former experience regulates the processes. The occurrences are in stable equilibrium when transparency prevails. Thus the subprocesses come within sight from a transparent inner environment. The flow of information is continual. The possibilities to assimilate between the mindies are many because of the nonspatial nature of the transparent environment. The rules of assimilation, absorption, and diffusion probably connect with former experience because old means often are applied to new situations. Unstable equilibrium exists when deviations occur from the transparent circumstances. It appears odd to assume, the transparent environment includes meanings; because transparency is nothingness, not true for example the radiation spectrum.

It is not easy to describe mind and some other process, exhaustively. The indirect evidence refers to the direction mind is a total process that can be compared to an active, distorted, dynamic, nonspatial gallery where the entities flow visibly, fade away in an organizing manner. Returning and flowing invisible according to the rules of

former experience applied to the pieces of contour and where the serial regulation implements the making of mindies, their combinations, controlling the fluctuations between the stable and unstable equilibrium.

Of course, the angle at mind is not exhaustive but the adult and young people's evidence warrants the above derivations. The getting ready of the croupier process occurs after the year 16. Anyway, a more scrutinized theoretical study will be performed when the interaction relations of the mindies are better known through the study

In the series of the studies the question is not yet about organized information that implies the hypothesis has a prominent feature of expectation. The assumption is the related self-esteem to social environment follows up the bell shaped curve and produces a similar curve of elastic-plastic processing of mindies where elasticity increases along time in 13-16 years of aged. The dynamic expectation is on the argument there are accelerated phases and thereafter the processes become more even when the organization of development is arranged. Thus it is consistent to assume that the processes follow up the shape of the

normal curve and interact. Persons do not behave in the same way in different environments. That is why it is necessary to differentiate the social environment into subenvironments. So the related self-esteem associates with (a) self (b) primary group = home (c) small group = peers (d) collective = class (e) social aggregate = school, and (f) other people. The object variable is the elastic-plastic processing of mindies and the subject variable is the related self-esteem to social environment.

Method

Subjects

The subjects were 80 pupils from a secondary comprehensive school in the same school district in Greater Helsinki.

Test Construction

Three items were for self-esteem in each part of the social environment. Part of the items presented high self-esteem, part low self-esteem. Thus self-esteem connects with a subenvironment. The elastic-plastic test included in three geometric figures: a rectangle, a circle, and a triangle put inside the other. The overlapping of the figures was

permuted. Two permutations were excluded from the series of the permutations. The reason for the arrangement was, through the permutations it was possible to see, whether the entire processing of the mindies (elasticity->plasticity-> transformation->elasticity among the mindies = processes) occurs. The production of the lacking permutations demands reconstruction of the relations of the geometric figures as an entire series. So the responses tell about function of mind processes when there is a need of modification of the processes. In addition, there are right answers to verify that makes it somewhat easy to infer the processes.

Procedure

The testing took place during the lessons and no observable disturbances or difficulties emerged during the situation. The answering lasted about 20 minutes.

The self-esteem questionnaire was instructed: There is below a set of arguments concerning you. If the thing of the argument is OK with You then you mark a cross beside the line of the argument: It is OK with me. If the thing does not apply to you then You mark a cross on the line: It is not OK with me.

The elastic-plastic test was instructed: There

is a figure series below that includes a circle, a rectangle, and a triangle. Two figures are lacking in the series and Your task is to complete the series in the way the series becomes an entity.

The number of the subjects included young persons of different age and the age distribution was: (a) 12, 13 years old (b) 31, 14 years old (c) 31, 15 years old, and (d) 6, 16 years old subjects.

Results

Reliability and Validity

The dichotomic nature of the questionnaire items made it possible to include in the items that had the highest frequencies of answering through the age groups. The usual scoring system was applied to the questionnaire items and the double negations were scored as ones. The procedure of scoring the elastic-plastic processing was somewhat more complex. The question was about two different permutations and simultaneously, the different overlaps. It was necessary to weight the permutations about the rightness of the overlaps. The order number of the circle was 1, the rectangle 2, and the triangle 3. The greatest weight (3) was given to the right innermost figure because it presumes the most

processing. The right middle figure had the weight of 2, and the outermost one had 1. So the scores of the permutations in the complete processing had the maximum value of $11 = 3 \cdot 1 + 2 \cdot 3 + 1 \cdot 2$ and $11 = 3 \cdot 2 + 2 \cdot 1 + 3 \cdot 1$. The other deficient scores were important in the scoring, too and there formed a scale for the processing. The score 22 meant the entire processing (permutation1+permutation2). The scores from 21 to 19 meant nearly entire processing. The scores from 18 to 10 purposed the partial processing. The scores less than 10 meant insufficient processing, and 0 was the erroneous processing of the mindies.

In this context it was not sensible to assess the reliability of the separate items which remained to present the related self-esteem to social environment. Instead, the measures of the whole self-esteem in the various subenvironments were evaluated with alpha-coefficient in each age group because the alpha is rather well established for the evaluation the measurement error. The alpha also was elastic-plastic processing coefficient through the age groups. The values proved to be as in Table 1.

Insert Table 1 about here

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Table 1

Reliabilities of Self-esteem and Elastic-Plastic
Processing

Variable	Age			
	13	14	15	16
Self-esteem	.99	.98	.98	.99
Elastic-Plastic Processing	.76	.79	.81	.92

The coefficients seem to be rather tolerable and so some confidence is present in the inferences.

Validity was assessed with Spearman's rho coefficient for self-esteem. The coefficients were calculated between the orders of the magnitudes of six items. Therefore, the way of evaluation warrants to utilize a kind of predictive validity concept. If the orders of the items are congruent with each other then the measures are not sensitive to age influences and the inference is the items measure what they are to measure. The rho-coefficients of self-esteem are in Table 2.

Insert Table 2 about here

The coefficients of the validity are rather tolerable and it has to be notified the rhos give values lower than in applying the correlation coefficient.

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Table 2

Spearman's rhos of Self-esteem between Age Groups

	Age			
	13	14	15	16
13		.57		
Age 14			1.00**	
15				.94*

** $p < .01$.

* $p < .05$.

The elastic-plastic processing measure demanded another kind of procedure to assess validity. The coefficient of forecasting efficiency was to present validity. The correlations between the permutation items were calculated in each age group and squared. The mean of the squared values was calculated and the index of forecasting efficiency was formed with $E=1-(\sqrt{1-r_{ij}^2})$. The procedure resulted in the value 0.15 that is low.

Analysis of Dynamism

To construct proper images of the variables it was necessary to calculate the means and standard deviations as shown in Table 3.

Insert Table 3 about here

There were different numbers of the subjects in the age groups. That is why the variable image construction took place in the following way. The number of the standard deviations was counted to reach the minima and maxima and subtracted from each other to know whether the values were less than or above mean. The proper standard deviations were multiplied by the difference values and the products were divided by

Table 3

Means, Standard Deviations, Minima and Maxima of
Related Self-Esteem and of Elastic-Plastic
Processing

Related self-esteem				
Age	Min.	Mean	Std	Max.
13	5	5.58	.49	6
14	4	5.22	.55	6
15	3	5.25	.80	6
16	4	5.50	.76	6
Elastic-plastic processing				
Age	Min.	Mean	Std	Max.
13	0	12.91	6.83	22
14	0	14.00	7.18	22
15	0	15.35	6.18	22
16	14	17.50	2.56	22

the means to obtain the applied coefficients of dispersion. The sign of the coefficients indicated the location of the values about the means. The values were converted into z -scores. The procedure resulted in the scores of 0.69, 0.49, -1.50, and 0.19 in the age order for self-esteem and the scores of 0.76, 0.74, -1.37, and -0.11 for elastic-plastic processing in the age order. The next operation was to find the best fit curves for the original ones. The best fit curves proved to be: self-esteem = $0.83 - 0.39z + 0.34 \tan(\sin(2z))$ and elastic-plastic processing = $1.02 - 0.45z + 0.34 \tan(\sin(1.85z))$

However, there is not much interest to have two separate functions because their connection is the crucial point that tells the "orbit" between the variables. That is why the normal simultaneous differential equation was solved with the first z -values as the initial conditions. The result was two exponential functions: self-esteem = $-0.035/e^z + 0.72e^z$ and elastic-plastic processing = $0.035/e^z + 0.72e^z$. In addition, the functions connect with the straight line equation that can already be verified from the above equations. Therefore, the "orbit" between the

functions associate with a straight line in time. The congruence of the curves is in Figure 1.

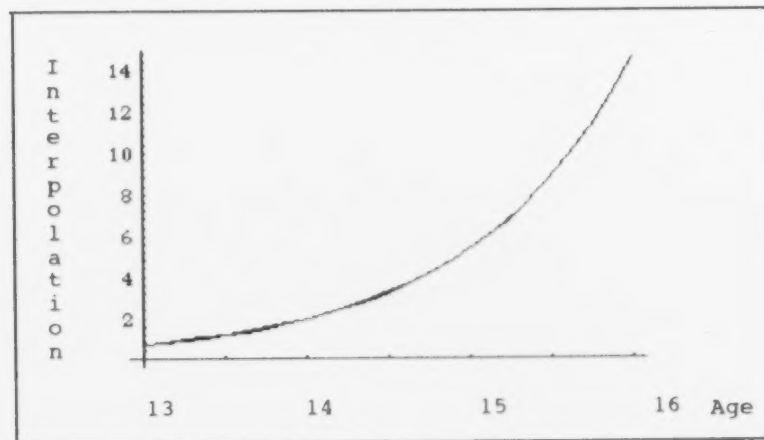
Insert Figure 1 about here

The curves are one on the top of the other. Naturally, the curves do not begin and end as in Figure 1. The curves are in between the overall developmental curves and an educated guess is they are sigmoidal in form. However, what takes place during the time interval under scrutiny is the focal point here.

Discussion

The hypothesis falsified. What then is the story the curves tell? At the bottom the situation is something like in courtship where the fiancée is the elastic-plastic processing and the go-between is self-esteem. The dialog emerges through the spokesman. At the beginning, not very much takes place because the prosperity of suitor is unclear. When the financial situation becomes clear the fiancée begins to pay attention to the suitor and sends a sign of acceptance of some degree from the corner of the eye and the events start to run. More seriously, between the years 13 and 14

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not very much takes place and there exists unstable equilibrium between the processes. After 14 years the curves become steeper. The steepness increases after 15 years considerably. Evidently, the dialog reaches a state of stable equilibrium. In a more practical way, reason comes into the picture.

The keener examination between the processes reveals the dialog takes place in the way social environment regulates and modifies self-esteem that mediates the impulses to the elastic-plastic processing of the mindies. Probable is the expectations of social environment change when children grow and they transform self-esteem that modifies the mindy processing, which means the increase of systematism and of organization in thinking. The processing of environmental meanings comes in line with social environment through the enhanced self-esteem. In praxis, the state of affairs is verifiable from the ceasing of hustle and behaving in a more organized way during the intervals in schools. Thus the trend is from an unstable equilibrium to a stable equilibrium and more controlled behavior. The planning of future and occupational choices come to play a major role little by little which demands pondering and reducing of

random proportion in behavior. As to self-esteem social environment produces and increases positiveness in it that promotes transfer towards stable equilibrium in the mindy processing. Gradually, the entire circle of elastic-plastic processing becomes possible and the croupier process begins to control processing of the mindies, and their interaction. As an entity, I can verify behavioral organization increases with social environment in usual conditions of living.

The results have a few theoretical implications. Nothing does refer to the belief Finnish children develop lousy self-esteem. On the contrary, positiveness of self-esteem functions as an excellent tool for the development of complete processing of mindies or for regulation processes of the unit processes. „The positiveness originates from social environment. That is why, theoretically, it might be wise to find out the junction processes that mediate between other processes because the explanations become more economical and theory construction needs fewer processes. Especially, it is essential that the processes are known from their functions because it

gives possibilities for educational arrangements to promote growth.

The trend is towards decentralized educational organizations, nowadays. It has its advantages and drawbacks. One of the drawbacks is the narrow minded schools of thought may get precedence in curriculum planning on the local level. Well, majority of teachers is decent persons but the counterweight is mean soul and lack of experiences from many different surroundings. Usually, the boundary conditions of thinking accompany the own occupational groups and no jumping over fences takes place. So teacher education has a crucial position in having many-sided skills of thinking, if it is possible to influence in thoughts of teacher candidates, at all. One of the means to progress the mindy processing is to increase "kinetics" of environmental information through presenting processes for example with the help of videos, not only to present a series of stils that is not a process. In fact, stability is an illusion because the third law of thermodynamics says oscillations are the state of the world. The fact, which is forgotten in teacher education, mostly.

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Figure Caption

Figure 1. Exponential curves of self-esteem and
elastic-plastic processing of mindies.